



# Marine Instrumentation Scalable Power Solution



Wide Input Voltage



Small Size, Low Profile



High Efficiency



High Temp Operation

## The Customer's Challenge

The challenge for marine instrumentation companies is to add more and more capabilities into increasingly smaller spaces. All without losing any measurement precision, and while operating reliably in extreme environments in terms of noise, vibration, high operating temperatures and humidity.

To broaden their available market one instrument manufacturer was developing a new system that could accommodate both 12V and 24V battery systems (needed to operate from 11.5 – 42V peak). To minimize design costs, and reduce the number of BOMs required, the power solution design also needed to be easily scaled to leverage development over several of the company's instrument types.

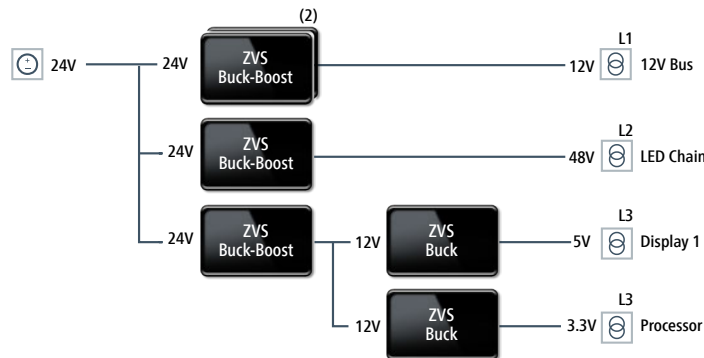
To enable the flexibility for easy retrofitting the company needed to reduce equipment size and profile.



## The Solution

The designers utilized four PI3740 ZVS buck-boost regulators to deliver the two regulated 12V rails and a higher output voltage rail. The wide input voltage range (8 – 60V) of these unique regulators enabled the customer's design team to use one design to support both the 12V and 24V system requirements.

Two ZVS buck regulators were used to provide two additional voltage rails below 12V.



[Link to Whiteboard »](#)

## The Results

The flexibility of the buck-boost and buck regulators was further enhanced by their low profile and small footprint (14 x 10 x 2.56mm). With the complete power solution measuring just 8.4cm<sup>2</sup>, easy installation was enabled across a wide range of instrument panels. In addition, the high efficiency (93.5% system efficiency) removed the need for bulky heat management. The high ambient operating temperature was handled with ease, with the products requiring no derating.

In addition to covering the varied needs of the original instrument design, the PI37xx series of high efficiency, wide input range buck-boost regulators enables scaling of the design for a wide range of different output voltage requirements. Indeed, the PI3740 itself can deliver a regulated output voltage adjustable from 10 – 50V<sub>DC</sub>.

### Product Family Key Specifications

#### Cool-Power® ZVS Buck-Boost Switching Regulators

<b>Input Voltages</b>	16 – 34V, 21 – 60V
<b>Output Voltages</b>	12 – 34V, 21 – 36V, 36 – 54V
<b>Output Power</b>	Up to 240W continuous
<b>Efficiency</b>	Over 98% efficiency at >800 kHz FSW
<b>Dimensions</b>	LGA SiP: 10 x 14 x 2.5mm

#### Cool-Power® ZVS Buck Regulator Module

<b>Input Voltages</b>	12V Nominal (8 – 18V <sub>IN</sub> ), 24V Nominal (8 – 36V <sub>IN</sub> ), 48V Nominal (8 – 60V <sub>IN</sub> ).
<b>Output Voltage</b>	Wide output range (1 – 16V)
<b>Output Current</b>	8A, 9A, 10A, and 15A versions
<b>Efficiency</b>	Up to 96.5% Light load and full load High efficiency performance
<b>Dimensions</b>	LGA SiP: 10 x 14 x 2.56mm